

Density
Dichte

Technical Information
Technische Information

56925TI1D
Rev. No.: 01, 01/2019

2 wire technology

The DuoSeries/DuoXPert measuring system consists of a scintillation detector – CrystalSENS point detector or UniSENS rod detector – and a sophisticated evaluation unit (DuoXPert) for display and operation.

The evaluation unit is a state-of-the-art control unit with robust 3.5" TFT touch panel, powerful Dual Core CPU and diverse operator interfaces. Advanced self diagnostics and monitoring features ensure a safe function of the system. Furthermore the data logging functionality allows operators to analyze their processes in depth, e.g. develop trends, track process changes etc.

Sophisticated measuring system in 2 wire technology

- Unique: Radiometric system with intrinsically safe power supply (Full Ex-i)
- Real 2-wire technology, only 2 wires in the field
- Advanced self diagnostics and monitoring features
- Easy to use touch screen panel for local display and operation
- Integrated gas density compensation feature
- Direct replacement of predecessor model LB 440
- Interfaces with all 2-wire detectors LB 44xx, LB 54xx and LB 47xx

2-Leiter Technologie

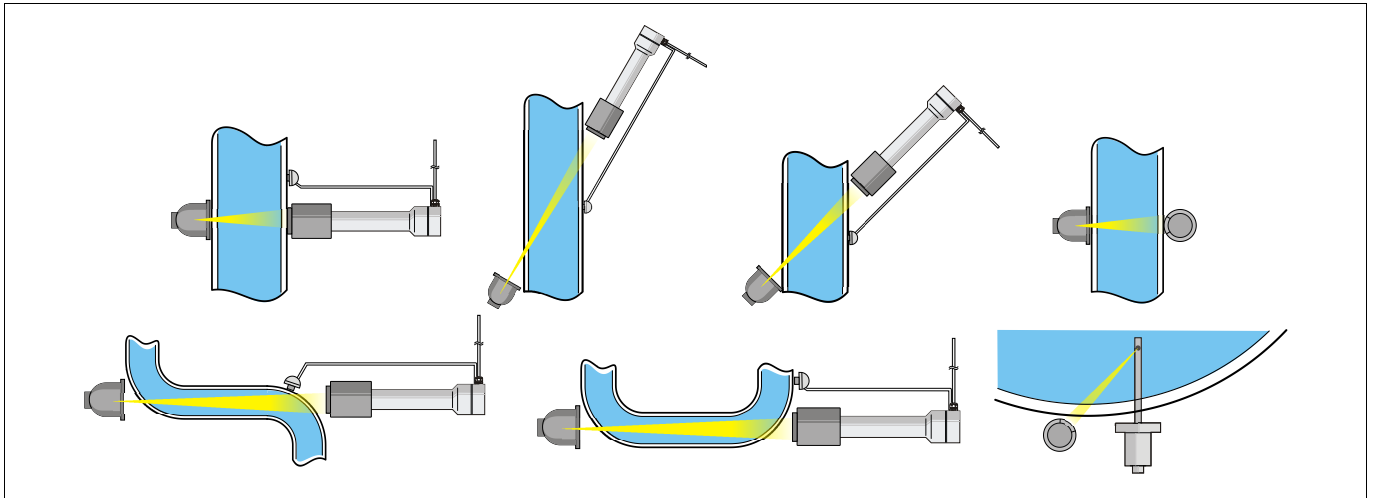
Das DuoSeries/DuoXpert Messsystem besteht aus einem Detektor mit Szintillator-Technologie – CrystalSENS Punktdetektor oder UniSENS Stabdetektor – sowie einer separaten Auswerteeinheit zur Anzeige und Bedienung.

Die moderne Auswerteeinheit verfügt über ein 3,5" Touch Panel, eine starke Dual Core CPU und verschiedenen Bedien-Optionen. Erweiterte Funktionen zur Selbstdiagnose und Überwachung sorgen zudem für höchste funktionale Sicherheit der Messung im Betrieb. Darüber hinaus können die Betreiber die Daten-Log Funktionen für eine detaillierte Prozessanalyse nutzen und so zum Beispiel Trends entwickeln oder Prozessänderungen nachvollziehen.

Hochentwickeltes Messsystem in 2-Leiter Technologie

- *Einzigartig: Radiometrische Messung mit eigensicherer Spannungsversorgung (Voll Ex-i)*
- *Echte 2-Leiter Technik, nur 2 Adern im Feld*
- *Verbesserte Diagnosefunktionen und Selbstüberwachung*
- *Einfache, intuitive Bedienung über Touch-Screen*
- *Integriertes Feature zur Kompensation von Gas-Phasen Schwankungen*
- *Volle Kompatibilität zum Vorgängermodell LB 440*
- *Kompatibel zu allen 2-Leiter Detektoren LB 44xx, LB54xx und LB 47xx*

Measurement arrangements density *Messanordnungen Dichte*

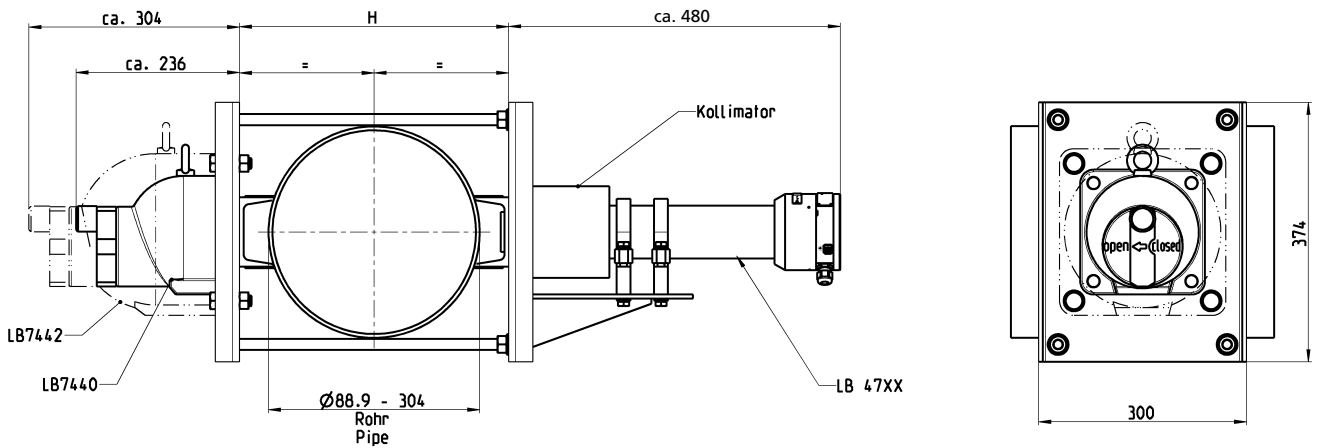
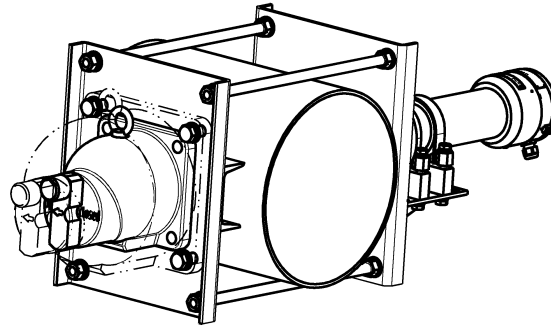


Measurement arrangements density *Messanordnungen für Dichtemessung*

Clamping Device 90° for Pipe Diameter 88.9... 304 mm Montagevorrichtung 90° für Rohrdurchmesser 88,9 ... 304mm

Material: Carbon Steel St37
 Material: Stahl St37

Painting: Polyurethane, gray
 Lackierung: Polyurethan, grau



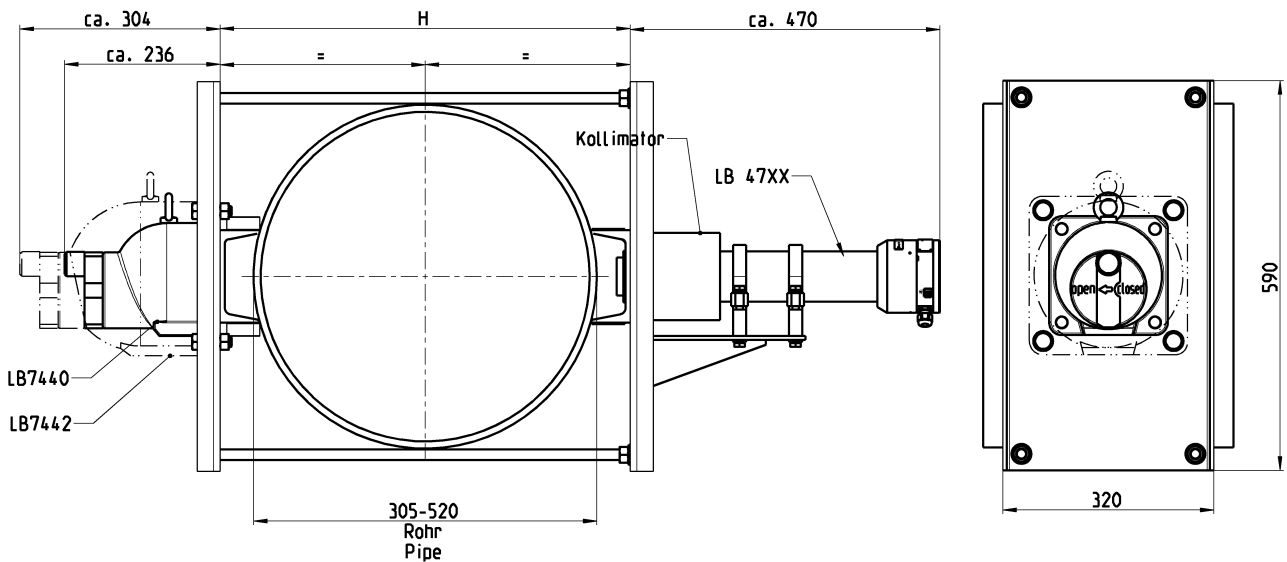
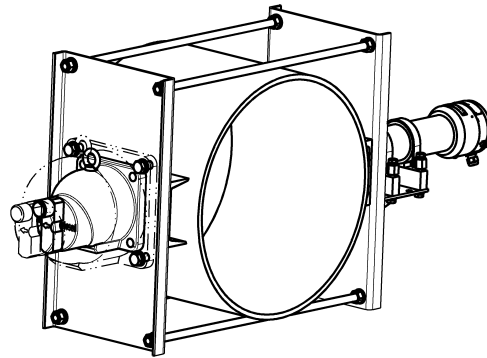
Dimensions in mm
 Abmessungen in mm

Part No. Id. Nr.	Pipe Diameter Rohrdurchmesser	H (mm)	Weight of Clamp. Device (kg) Gewicht Montagevorrichtung (kg)
80795	88.9	120	23
	101.6	156	
	114.3	180	
	141.3	218	
	168.3	250	
	219.1	310	
	237.0	368	
	304.0	402	

Clamping Device 90° for Pipe Diameter 305 ... 521 mm Montagevorrichtung 90° für Rohrdurchmesser 305 ... 521 mm

Material: Carbon Steel St37
 Material: Stahl St37

Painting: Polyurethane, gray
 Lackierung: Polyurethan, grau



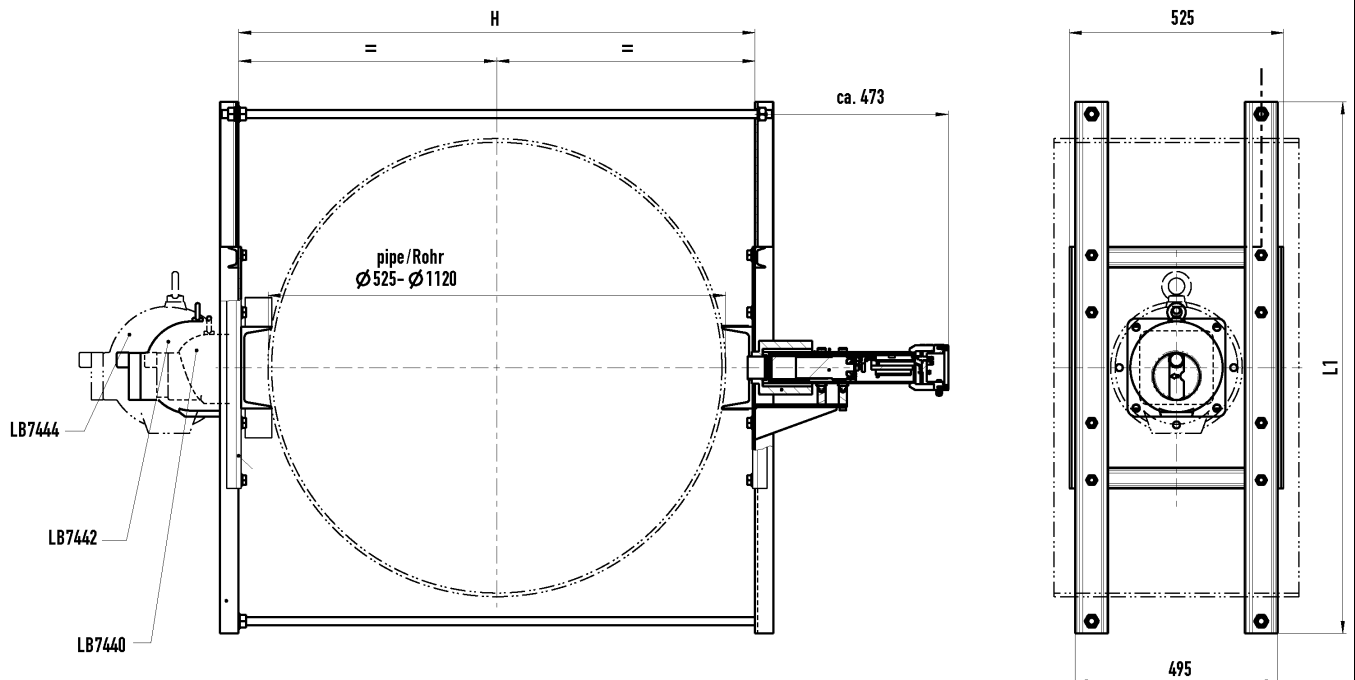
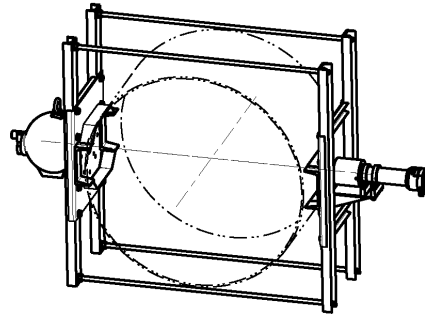
Dimensions in mm
 Abmessungen in mm

Part No. Id. Nr.	Pipe Diameter Rohrdurchmesser	H (mm)	Weight of Clamp. Device (kg) Gewicht Montagevorrichtung (kg)
80796	305.5	400	34
	318.0	413	
	323.8	419	
	355.6	451	
	406.4	501	
	457.2	552	
	508.0	603	
	521.0	616	

Clamping Device 90° for Large Pipe Diameters Montagevorrichtung 90° für große Rohrlingsquerschnitte

Material: Carbon Steel St37
 Material: Stahl St37

Painting: Polyurethane, gray
 Lackierung: Polyurethan, grau



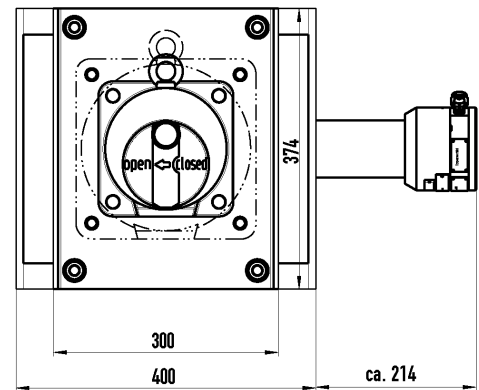
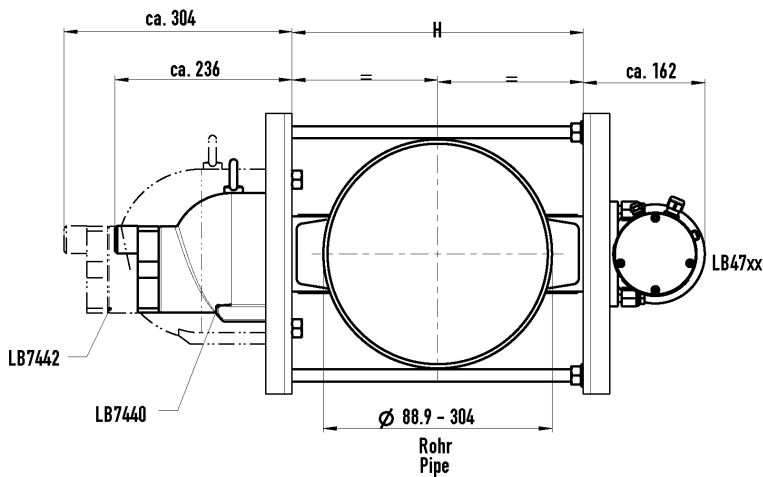
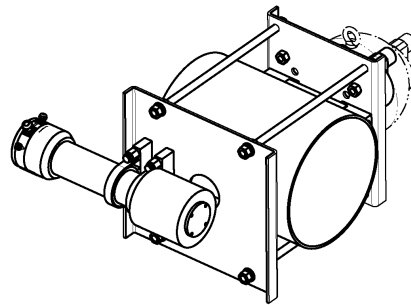
Dimensions in mm
 Abmessungen in mm

Part No. Id. Nr.	Pipe Diameter Rohrdurchmesser	H (mm)	L1 (mm)	L (mm)	Weight of Clamp. Device (kg) Gewicht Montagevorrichtung (kg)
51872-01	400 ... 519	643	735	680	76
51872-02	520 ... 559	686	790	680	77
51872-03	560 ... 659	792	890	740	79
51872-04	660 ... 759	896	990	840	84
51872-05	760 ... 869	1009	1100	950	89
51872-06	870 ... 1020	1163	1250	1200	98
51872-07	1020 ... 1120	1265	1350	1300	103

Parallel Clamping Device 90° for Pipe Diameter 88.9 ... 304 mm Parallele Montagevorrichtung 90° für Rohrdurchmesser 88,9 ... 304 mm

Material: Carbon Steel St37
 Material: Stahl St37

Painting: Polyurethane, gray
 Lackierung: Polyurethan, grau



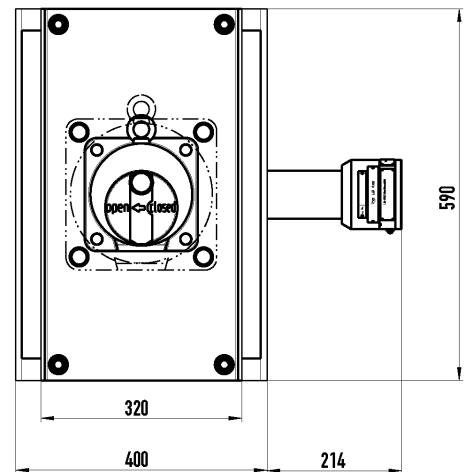
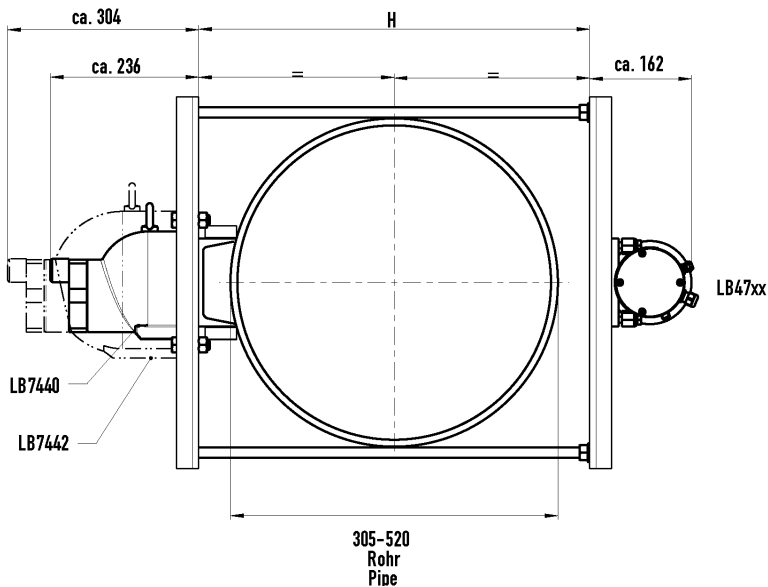
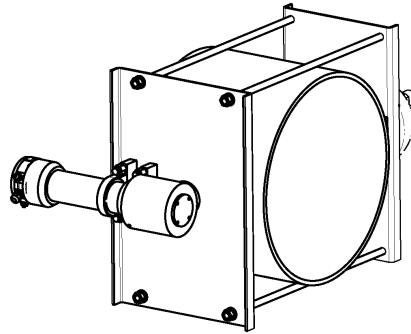
Dimensions in mm
 Abmessungen in mm

Part No. Id. Nr.	Pipe Diameter Rohrdurchmesser	H (mm)	Weight of Clamp. Device (kg) Gewicht Montagevorrichtung (kg)
59296	88.9	120	22
	101.6	156	
	114.3	180	
	141.3	218	
	168.3	250	
	219.1	310	
	273.0	368	
	304.0	402	

Parallel Clamping Device 90° for Pipe Diameter 305 ... 521 mm Parallele Montagevorrichtung 90° für Rohrdurchmesser 305 ... 521 mm

Material: Carbon Steel St37
 Material: Stahl St37

Painting: Polyurethane, gray
 Lackierung: Polyurethan, grau



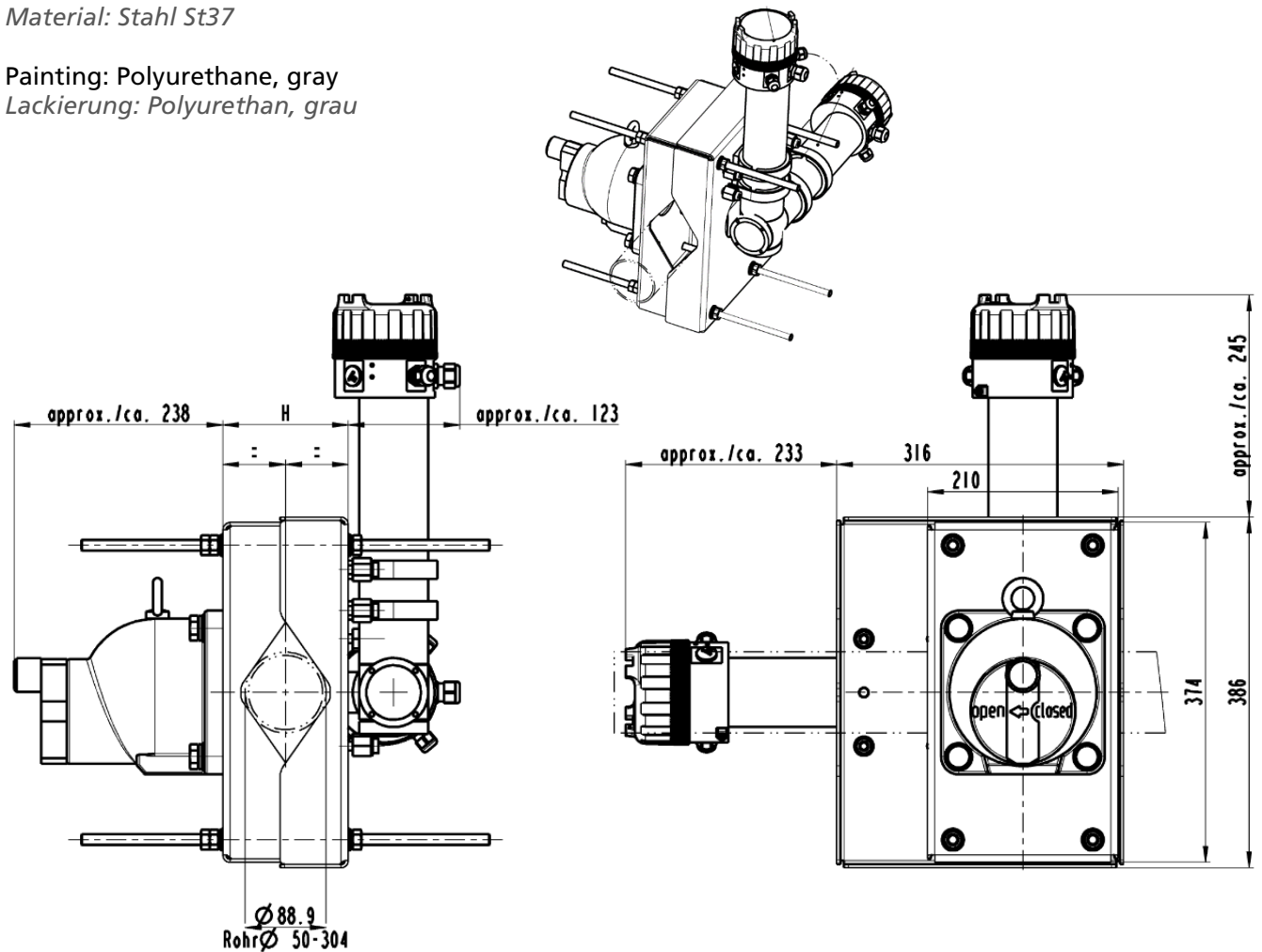
Dimensions in mm
 Abmessungen in mm

Part No. Id. Nr.	Pipe Diameter Rohrdurchmesser	H (mm)	Weight of Clamp. Device (kg) Gewicht Montagevorrichtung (kg)
59293	305.0	400	34
	318.0	413	
	323.8	419	
	355.6	451	
	406.4	501	
	457.2	552	
	508.0	603	
	521.0	616	

Parallel Clamping Device for Pipe Diameter 50 ... 305 mm Parallele Montagevorrichtung für Rohrdurchmesser 50... 305 mm

Material: Carbon Steel St37
 Material: Stahl St37

Painting: Polyurethane, gray
 Lackierung: Polyurethan, grau



Dimensions in mm
 Abmessungen in mm

Part No. Id. Nr.	Pipe Diameter Rohrdurchmesser	H (mm)	Weight of Clamp. Device (kg) Gewicht Montagevorrichtung (kg)
63277	50	91	13
	60	103	
	76,1	123	
	88,9	138	
	114,3	169	
	141,3	202	
	219,1	297	
	270	359	
	304	401	

Parallel Clamping Device for Pipe Diameter 50 ... 305 mm for Detectors with Collimator

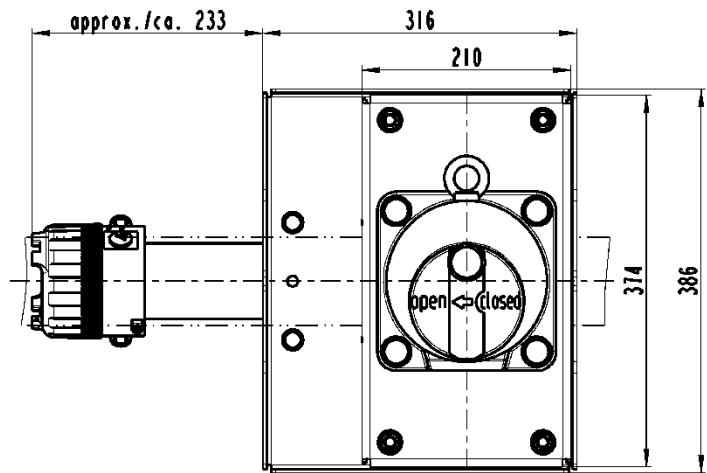
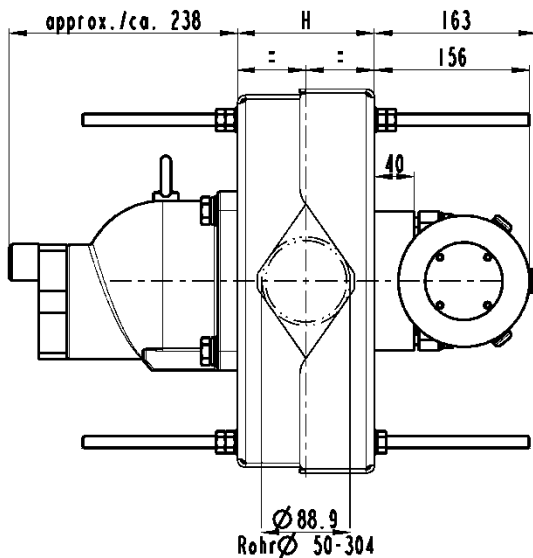
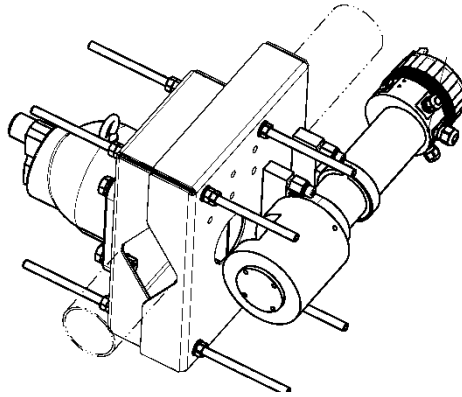
Parallele Montagevorrichtung für Rohrdurchmesser 50... 305 mm für Detektoren mit Kollimator

Material: Carbon Steel St37

Material: Stahl St37

Painting: Polyurethane, gray

Lackierung: Polyurethan, grau



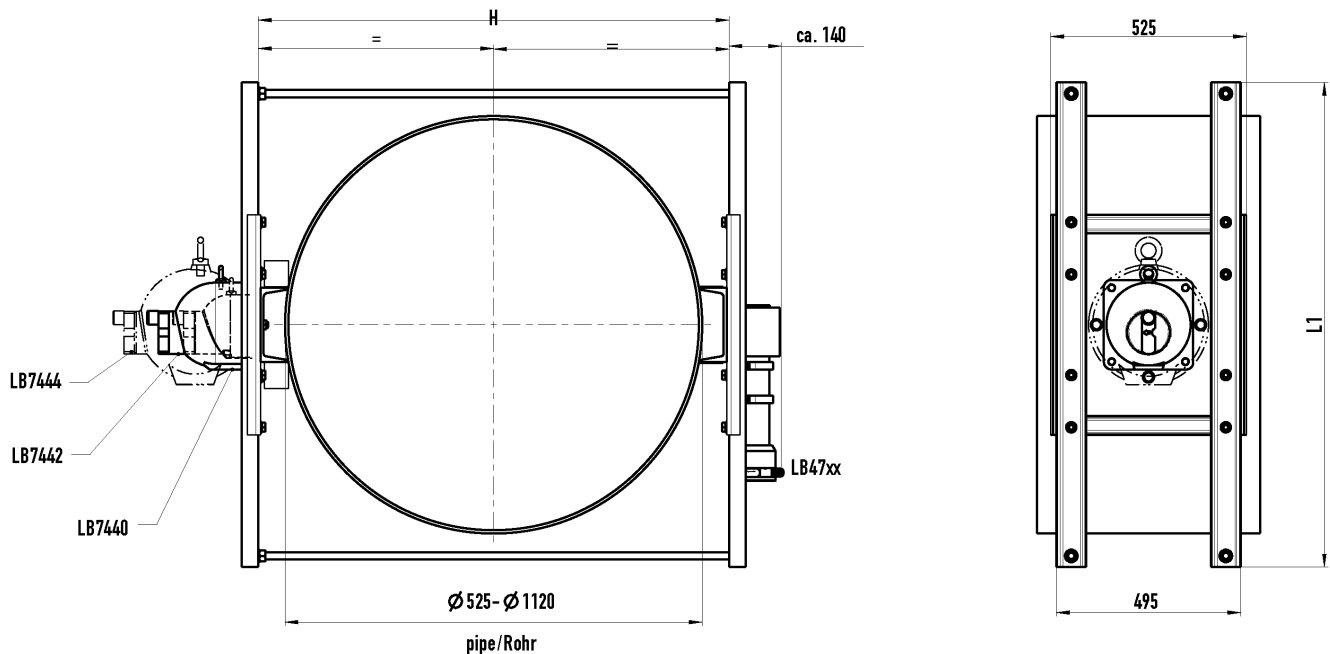
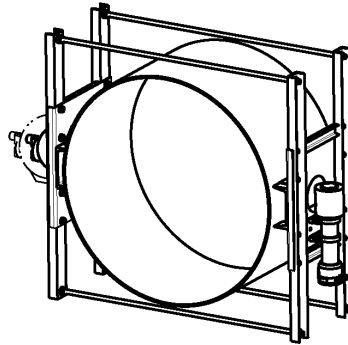
Dimensions in mm
 Abmessungen in mm

Part No. Id. Nr.	Pipe Diameter Rohrdurchmesser	H (mm)	Weight of Clamp. Device (kg) Gewicht Montagevorrichtung (kg)
63280	50	91	14
	60	103	
	76,1	123	
	88,9	138	
	114,3	169	
	141,3	202	
	219,1	297	
	270	359	
	304	401	

Clamping Device 90° for for Large Pipe Diameters Montagevorrichtung 90° für große Rohrleitungsquerschnitte

Material: Carbon Steel St37
 Material: Stahl St37

Painting: Polyurethane, gray
 Lackierung: Polyurethan, grau



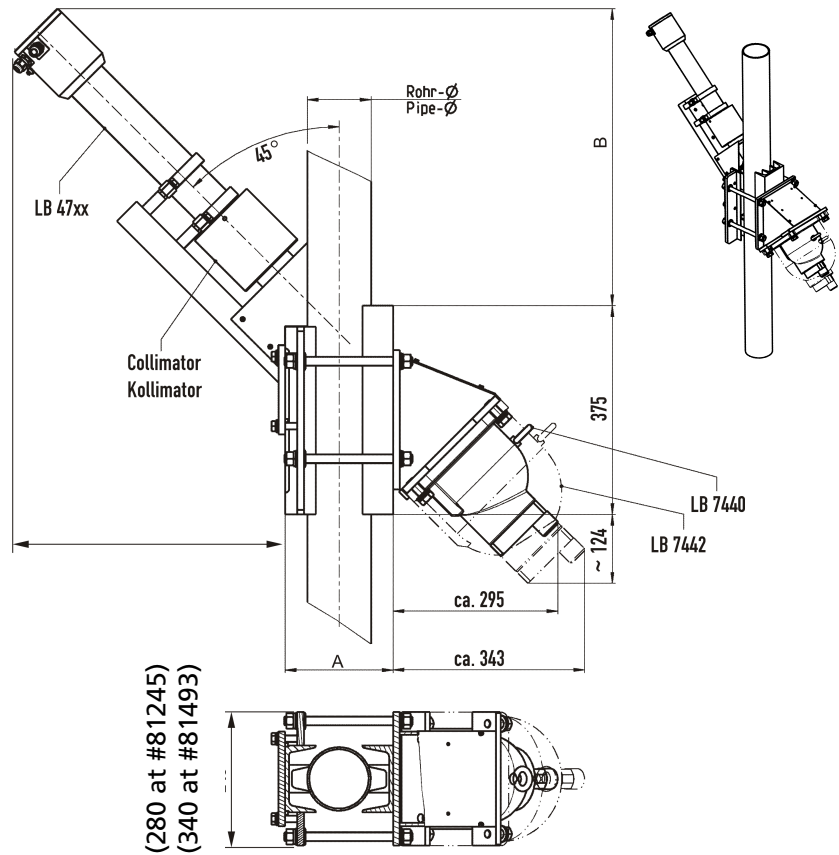
Dimensions in mm
 Abmessungen in mm

Part No. Id. Nr.	Pipe Diameter Rohrdurchmesser	H (mm)	L1 (mm)	L (mm)	Weight of Clamp. Device (kg) Gewicht Montagevorrichtung (kg)
81491-01	400 ... 519	643	735	680	73
81491-02	520 ... 559	686	790	680	74
81491-03	560 ... 659	792	890	740	76
81491-04	660 ... 759	896	990	840	79
81491-05	760 ... 869	1009	1100	950	86
81491-06	870 ... 1020	1163	1250	1200	95
81491-07	1020 ... 1120	1265	1350	1300	100

Clamping Device 45° Montagevorrichtung 45°

Material: Carbon Steel St37
 Material: Stahl St37

Painting: Polyurethane, gray
 Lackierung: Polyurethan, grau



Dimensions in mm
 Abmessungen in mm

Part No. Id. Nr.	Pipe Diameter Rohr- durchmesser	A (mm)	B (mm)	Weight (kg) Gewicht (kg)
27249	48.3	128	470	31
27248	60.3	128	470	
27250	63.3	133	475	
27251	70.0	142	484	
27252	76.1	149	490	
27253	82.5	157	498	
27254	88.9	165	506	
27255	95.0	172	512	
27256	101.6	179	519	
27257	108.0	187	526	
27258	114.3	194	533	
80794	121.0	201	540	

Part No. Id. Nr.	Pipe Diameter Rohr- durchmesser	A (mm)	B (mm)	Weight (kg) Gewicht (kg)
80793	170.0	165	513	30
26997	133.0	177	524	
26998	139.7	189	535	
26999	146.0	199	545	
27000	152.4	207	553	
27001	159.0	219	563	
27002	165.1	227	571	
27003	168.3	232	575	
27004	171.0	235	579	
27005	177.8	244	588	
27006	191.0	261	604	
81245	220.0	296	636	
81493	273.0	356	696	

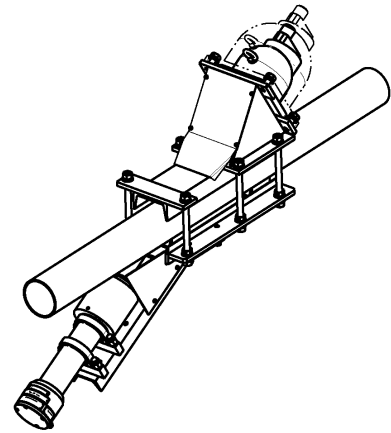
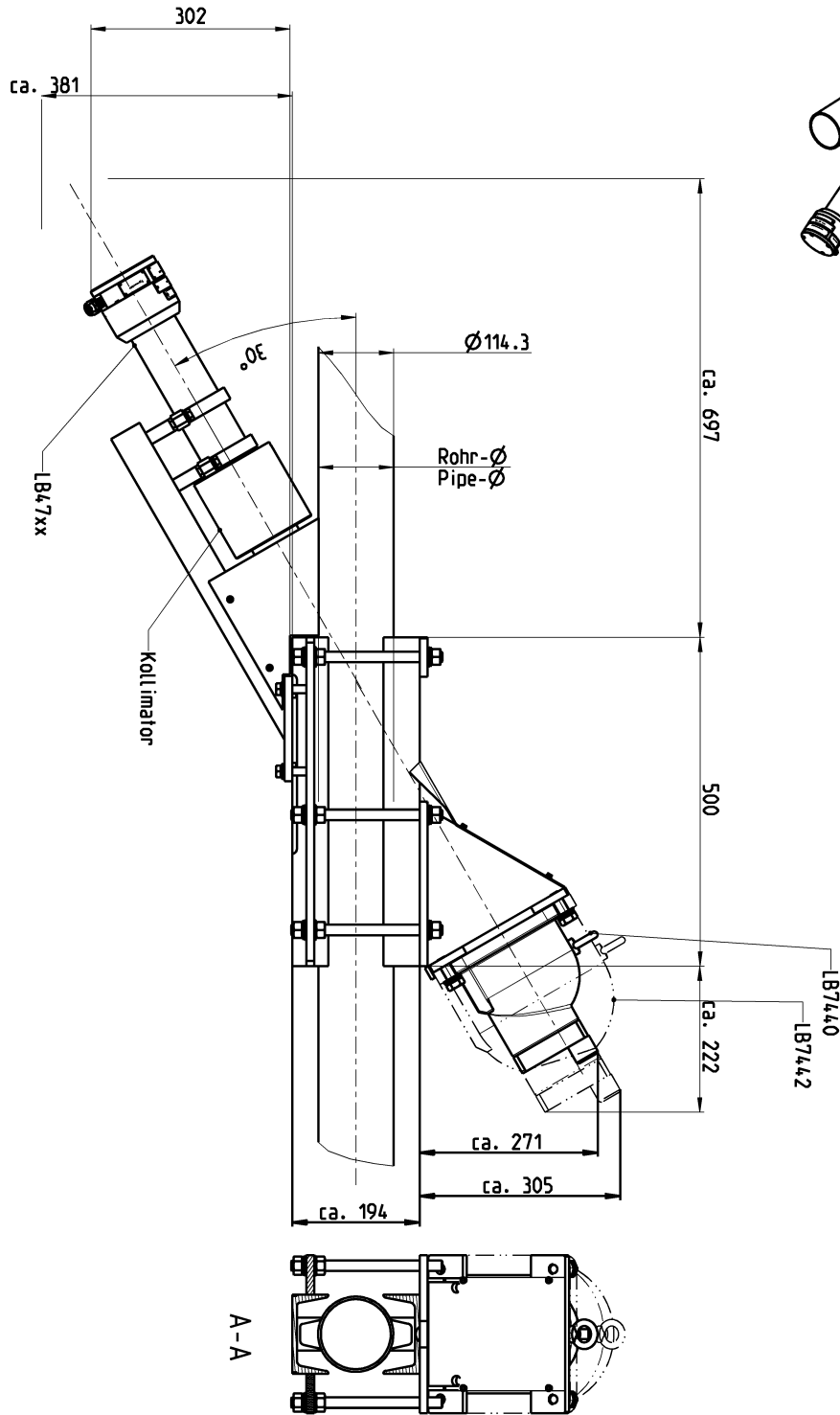
Clamping Device 30° Montagevorrichtung 30°

Material: Carbon Steel St37

Material: Stahl St37

Painting: Polyurethane, gray

Lackierung: Polyurethan, grau



Dimensions in mm
Abmessungen in mm

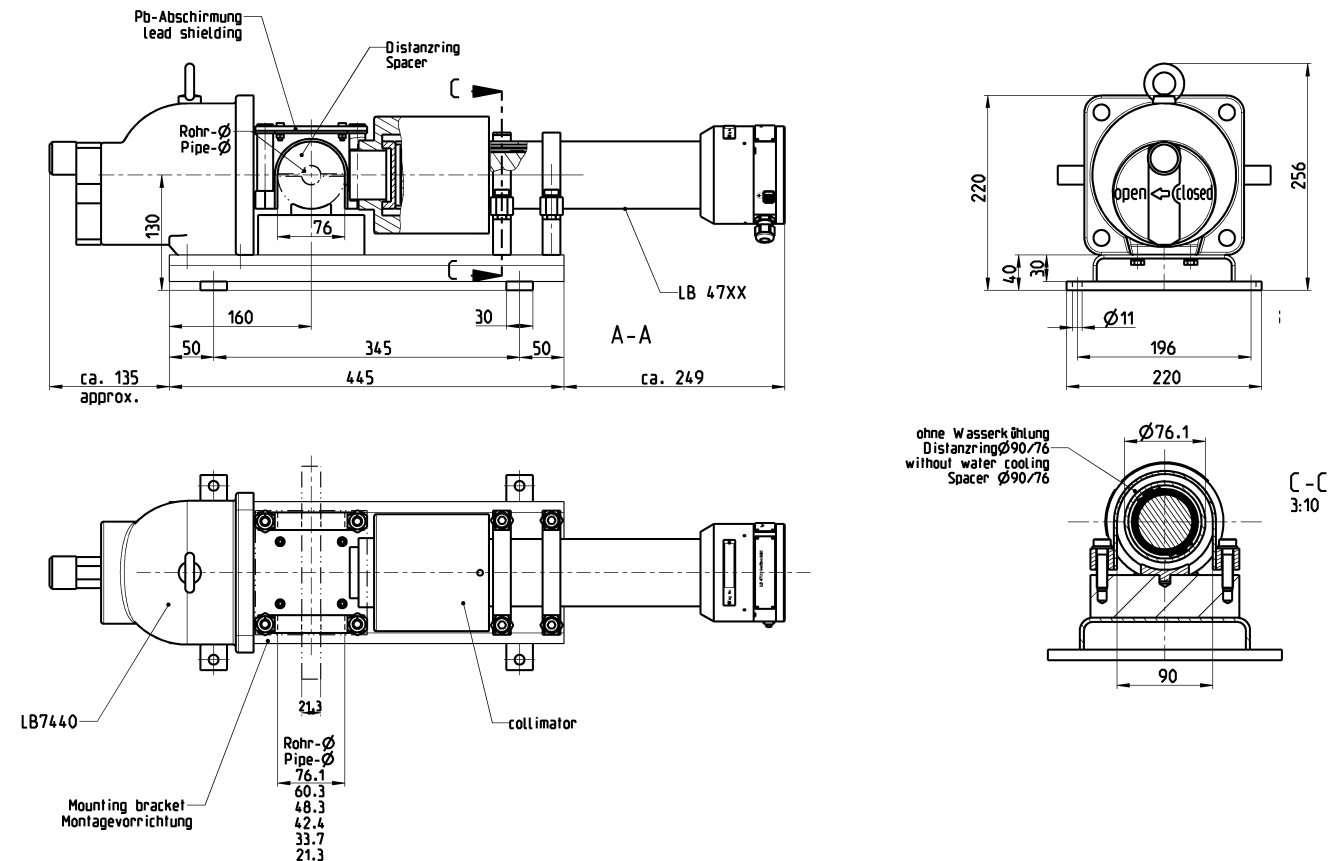
Part No. Id. Nr.	Pipe Diameter Rohr- durchmesser	A (mm)	B (mm)	Weight (kg) Gewicht (kg)
25964	48.4	128	589	39
80792	60.3	128	589	
25971	63.5	133	597	
25972	70.0	142	612	
25973	76.1	149	623	
25974	82.5	157	637	
25975	88.9	165	650	
25976	95.0	172	661	
25977	101.6	179	673	
25978	108.0	187	685	
25979	114.3	194	697	
25980	121.0	201	710	

Part No. Id. Nr.	Pipe Diameter Rohr- durchmesser	A (mm)	B (mm)	Weight (kg) Gewicht (kg)	
80791	127.0	165	611	39	
26655	133.0	177	679		
26656	139.7	189	699		
26657	146.0	199	715		
26658	152.4	209	728		
26659	159.0	219	746		
26660	165.1	227	760		
26661	168.3	232	767		
26662	171.0	235	774		
26669	177.8	244	790		
26664	191.0	261	817		
81246	220.0	296	871		
81485	273.0	356	975		40

Parallel Clamping Device 90° for small Pipe Diameters Parallele Montagevorrichtung 90° für kleine Rohrdurchmesser

Material: Carbon Steel St37
 Material: Stahl St37

Painting: Polyurethane, gray
 Lackierung: Polyurethan, grau



Dimensions in mm
 Abmessungen in mm

Part No. Id. Nr.	Pipe Diameter Rohrdurchmesser	Weight of Clamp. Device (kg) Gewicht Montagevorrichtung (kg)
47292-01	21.3	70
47292-02	33.7	
47292-03	42.4	
47292-04	48.3	
47292-05	60.3	
47292-06	76.1	

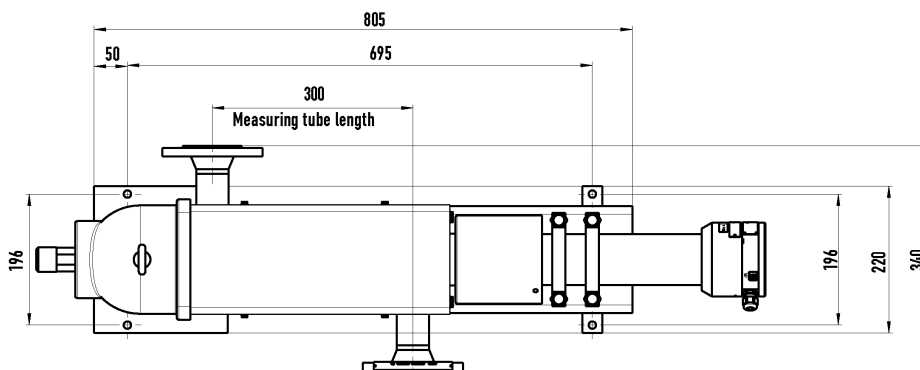
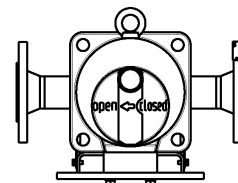
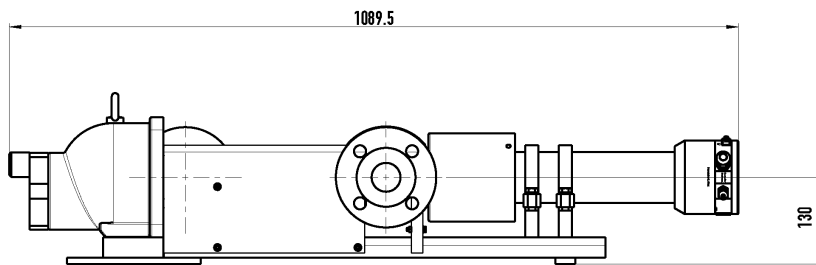
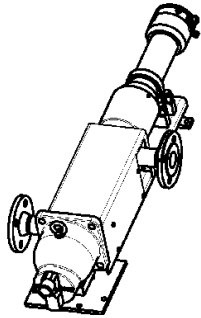
S + U Pipe Clamping Device *S + U förmige Montagevorrichtung*

Material: Carbon Steel St37

Material: Stahl St37

Painting: Polyurethane, gray

Lackierung: Polyurethan, grau



Dimensions in mm

Abmessungen in mm

Various versions available. The drawing above shows exemplarily a clamping device with:

- S-shaped
- DN40
- pipelength300
- PN16
- without temp.-sensor

Verschiedene Versionen erhältlich.

- Obige beispielhafte Abbildung zeigt die Messstrecke in:

- S-Form
- DN40
- Messrohrlänge300
- PN16
- ohne Temp.-Fühler



Evaluation unit *Auswerteeinheit*

Evaluation unit

The modules can be installed either in wall housings or 19" subracks. It can be equipped differently, depending on requirements. The rear clamp blocks or terminal panels are used for the electrical connection.

Auswerteinheit

Die Module können entweder in Wandgehäusen oder 19"-Baugruppenträgern eingebaut und kann je nach Bedarf unterschiedlich bestückt werden. Zum elektrischen Anschluss werden die rückwärtigen Klemmenblöcke oder Anschlussplatinen verwendet.

NOTICE / HINWEIS



Detector of the type LB44xx and LB54xx can capture measurement data only with master EVU.

Messdaten der Detektoren vom Typ LB44xx und LB54xx können nur mit einem Master-Modul erfasst werden.

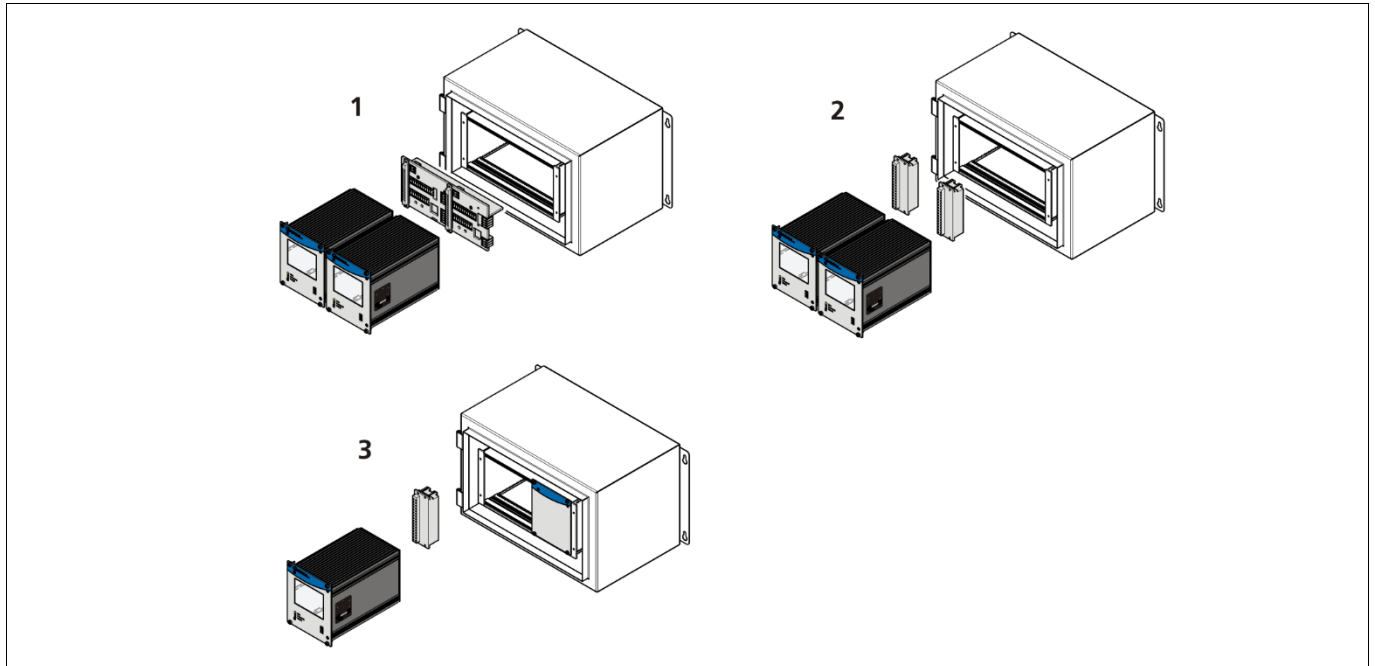
NOTICE / HINWEIS



The Evaluation unit is not explosion protected and is not designed for hazardous environments.

Diese Auswerteinheit ist nicht ex-geschützt ausgeführt und darf nicht in explosionsgefährdete Bereiche verwendet werden.

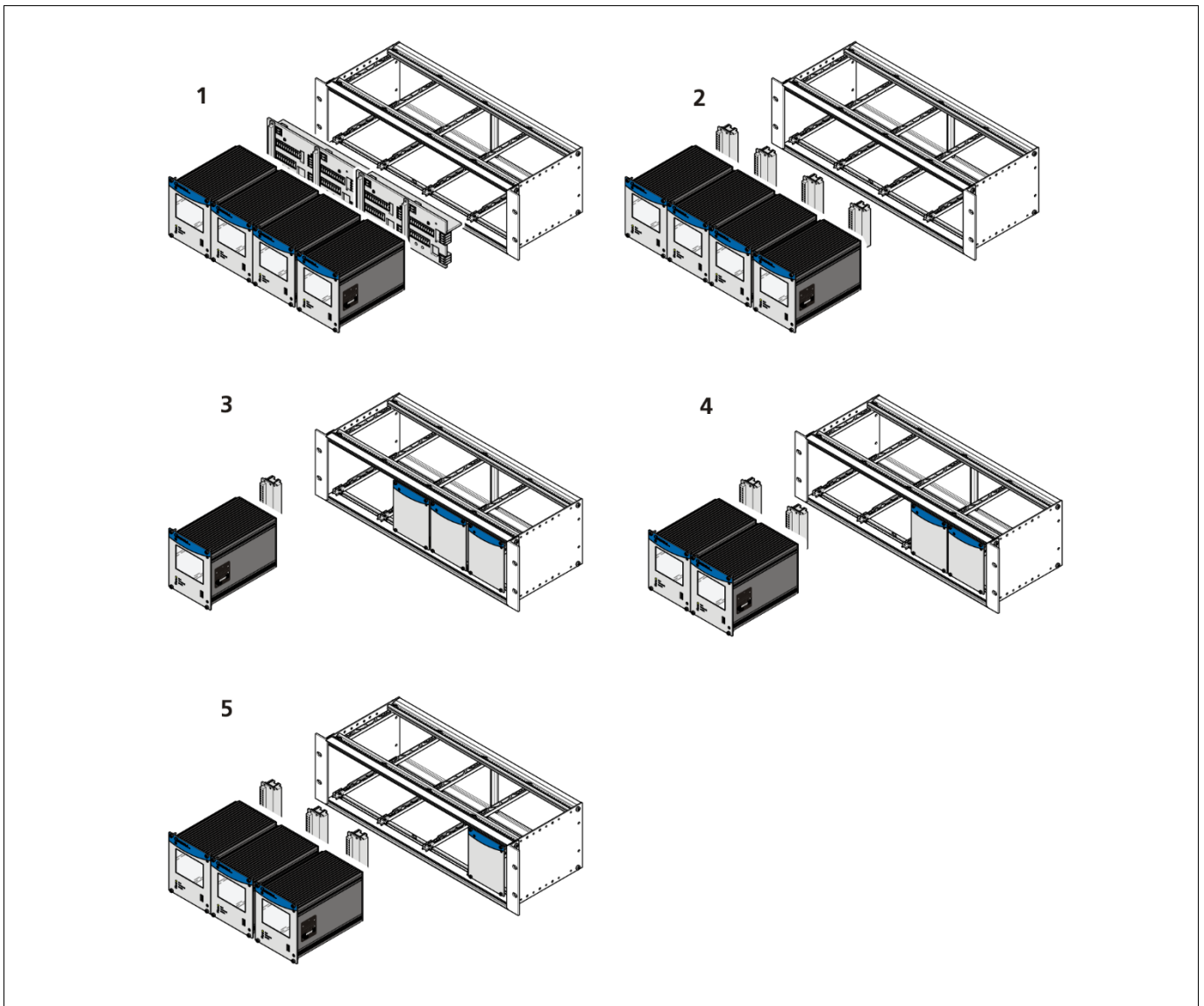
Installation variants wall housing Einbauvarianten Wandgehäuse



Item Pos.	Compons Komponenten	Connection Anschluss
1	2 Master	1 Terminal panel master/master ¹ 1 Anschlussplatine Master/Master ¹
2	2 Master	2 Terminal blocks 2 Klemmenblöcke
3	1 Master, 1 blanking panel 1 Master, 1 Blindplatte	1 Terminal block 1 Klemmenblock

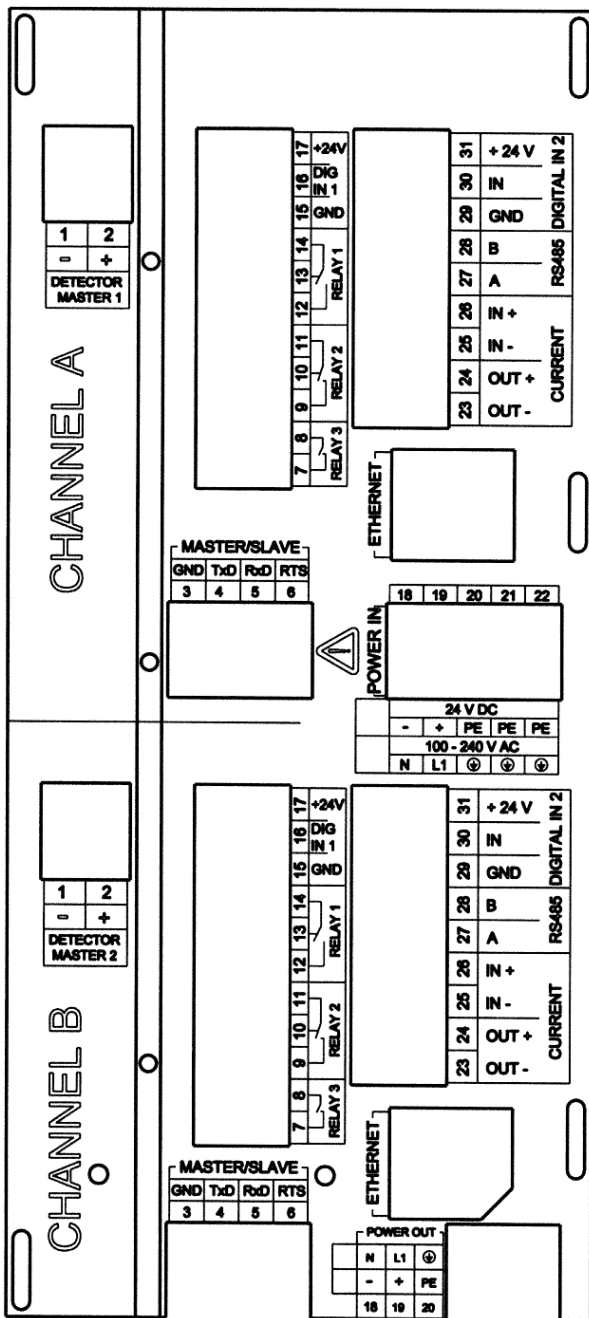
¹ NRTL certification US/CAN
 NRTL Zertifikat US/CAN

Installation variants 19" subrack Einbauvarianten 19" Baugruppenträger



Item Pos.	Componsens Komponenten	Connection Anschluss
1	4 Master	2 Terminal panel master/master 2 Anschlussplatinen Master/Master
2	4 Master	4 Terminal blocks 4 Klemmenblöcke
3	1 Master, 3 blanking panels 1 Master, 3 Blindplatten	1 Terminal block 1 Klemmenblock
4	2 Master, 2 blanking panels 2 Master, 2 Blindplatten	2 Terminal blocks 2 Klemmenblöcke
5	3 Master, 1 blanking panel 3 Master, 1 Blindplatte	3 Terminal blocks 3 Klemmenblöcke

Connection diagram terminal board master/master Anschlussplan Anschlussplatine Master/Master



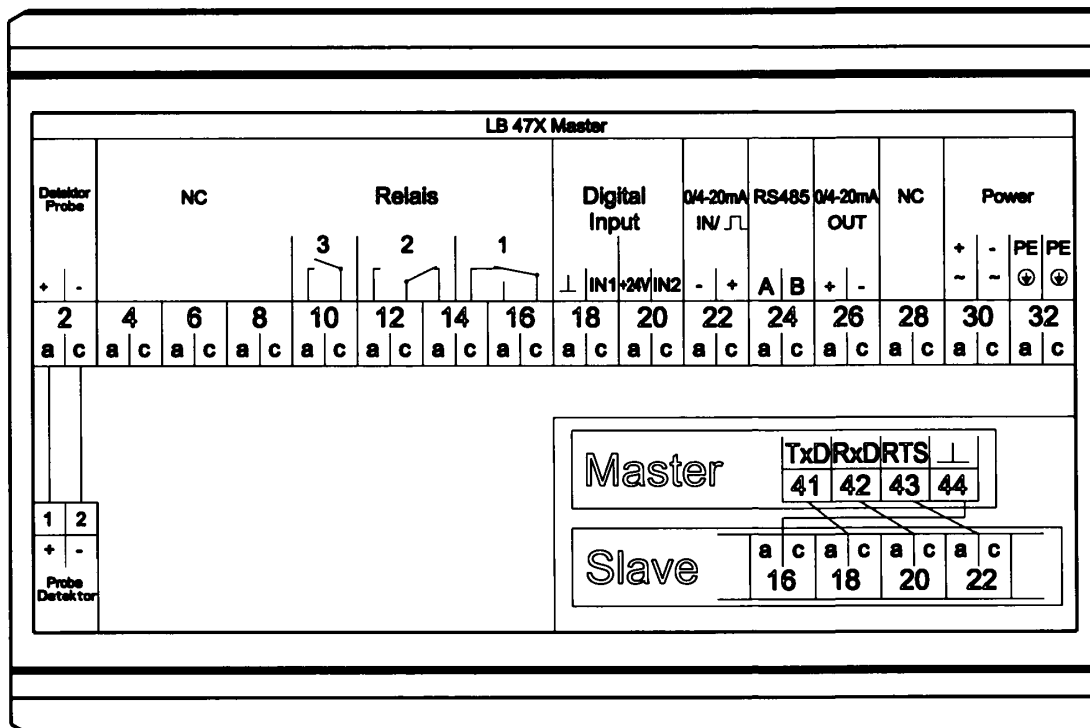
#	Connector Anschluss	Function Funktion
1	DETECTOR MASTER -	Connection Detector Verbindung Detektor LB 4700 / LB 44xx
2	DETECTOR MASTER +	
3	MASTER/SLAVE GND	Connection of additional slave units Anschluss von weiteren Slave-Einheiten
4	MASTER/SLAVE TxD	
5	MASTER/SLAVE RxD	
6	MASTER/SLAVE RTS	
7	RELAIS 3 NC	
8	RELAIS 3 COM	
9	RELAIS 2 NC	DIGITAL OUT
10	RELAIS 2 NO	
11	RELAIS 2 COM	Error DIGITAL OUT Fehler DIGITAL OUT
12	RELAIS 1 NC	
13	RELAIS 1 NO	GND
14	RELAIS 1 COM	
15	DIGITAL IN 1 GND	Logic Input
16	DIGITAL IN 1 IN	
17	DIGITAL IN 1 + 24 V	24 V out (max. 200 mA)
18	POWER DC 24 V - / AC N	
19	POWER DC 24 V + / AC L1	24 V DC / 100-240 V AC
20	PE	
21	PE	
22	PE	4 mA ... 20 mA
23	CURRENT OUT -	
24	CURRENT OUT +	Not used for LB 474 Wird bei LB 470 nicht verwendet
25	CURRENT IN -	
26	CURRENT IN +	Communication and service interface (Master-Master) Kommunikations- und Service-Schnittstelle (Master-Master)
27	RS 485 A	
28	RS 485 B	GND
29	DIGITAL IN 2 GND	
30	DIGITAL IN 2 IN	Logic Input
31	DIGITAL IN 2 + 24 V	

In a 19" subrack for 4 masters (Id 59484), there is another one with Channel C / D next to the connector board for Channel A / B. The channel assignment of Channel C / D is identical to that of Channel A / B.

In einem 19" Baugruppenträger für 4 Master (Id.59484), ist neben der oben gezeigten Anschlussplatine für Channel A/B, eine weitere mit Channel C/D enthalten. Die Klemmenbelegung von Channel C/D ist identisch mit der von Channel A/B.

Assignment terminal block master EVU Belegung Klemmenblock Master AWE

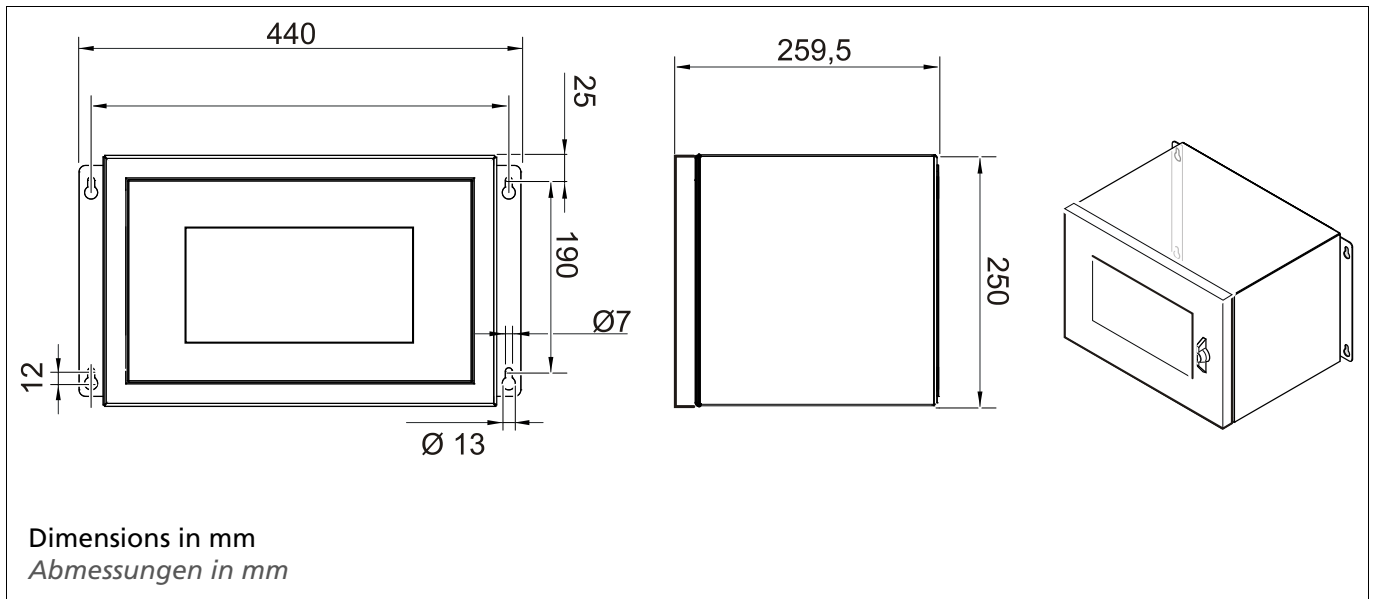
Signal	Pin		Pin	Signal
DETECTOR GND	C - 2		A - 2	DETECTOR +
not assigned <i>nicht belegt</i>	C - 4		A - 4	not assigned <i>nicht belegt</i>
not assigned <i>nicht belegt</i>	C - 6		A - 6	not assigned <i>nicht belegt</i>
not assigned <i>nicht belegt</i>	C - 8		A - 8	not assigned <i>nicht belegt</i>
RELAY <i>RELAIS</i> 3 COM	C - 10		A - 10	RELAY <i>RELAIS</i> 3 NO
RELAY <i>RELAIS</i> 2 COM	C - 12		A - 12	RELAY <i>RELAIS</i> 2 NO
RELAY <i>RELAIS</i> 1 NC	C - 14		A - 14	RELAY <i>RELAIS</i> 2 NC
RELAY <i>RELAIS</i> 1 COM	C - 16		A - 16	RELAY <i>RELAIS</i> 1 NO
DIGITAL IN 1	C - 18		A - 18	DIGITAL IN 1 GND
DIGITAL IN 2	C - 20		A - 20	+ 24 V
CURRENT IN +	C - 22		A - 22	CURRENT IN -
RS 485 B	C - 24		A - 24	RS 485 A
CURRENT OUT -	C - 26		A - 26	CURRENT OUT +
not assigned <i>nicht belegt</i>	C - 28		A - 28	not assigned <i>nicht belegt</i>
Main <i>Netz</i> N, DC 24 V -	C - 30		A - 30	Main <i>Netz</i> L1, 24 V DC +
Protective conductor PE <i>Schutzleiter PE</i>	C - 32		A - 32	Protective conductor PE <i>Schutzleiter PE</i>



The "SLAVE" connection terminals are not used on the EVU LB 474.

Die Anschlussklemmen „SLAVE“ werden bei der AWE LB 474 nicht verwendet.

Wall housing Wandgehäuse

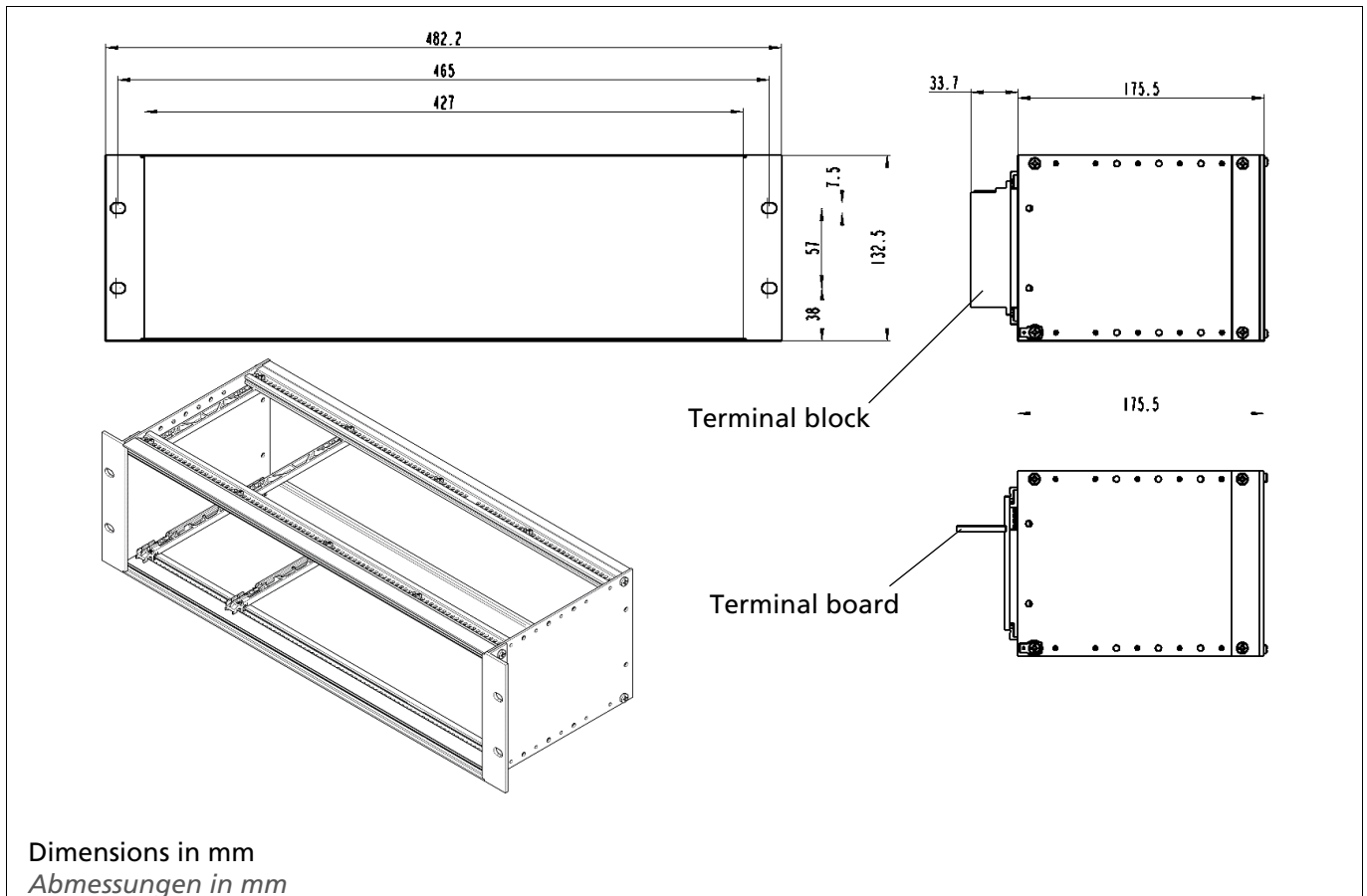


Technical Data Technische Daten	
Dimensions Abmessungen	440x250x257mm (WxHxD)
Max. Assembly Max. Bestückung	<ul style="list-style-type: none"> - 2 Master with terminal board (master/master) ¹ - 2 Master mit Anschlussplatine (Master/Master) ¹ - 1 Master, 3 Slave with terminal board (master/slave) - 1 Master, 3 Slave mit Anschlussplatine (Master/Slave) - 2 Master with calmp blocks ² - 2 Master mit Klemmenblöcken ²
Weight (with circuit board, without modules) Gewicht (mit Anschlussplatine, ohne Module)	8.8 kg
Degree of protection Schutzgrad	IP65
Operational temperature Betriebstemperatur	-20°C ... +40°C
User interface, colours Oberfläche, Farbe	powder coated, grey pulverbeschichtet, grau

¹ NRTL certification US/CAN
 NRTL Zertifikat US/CAN

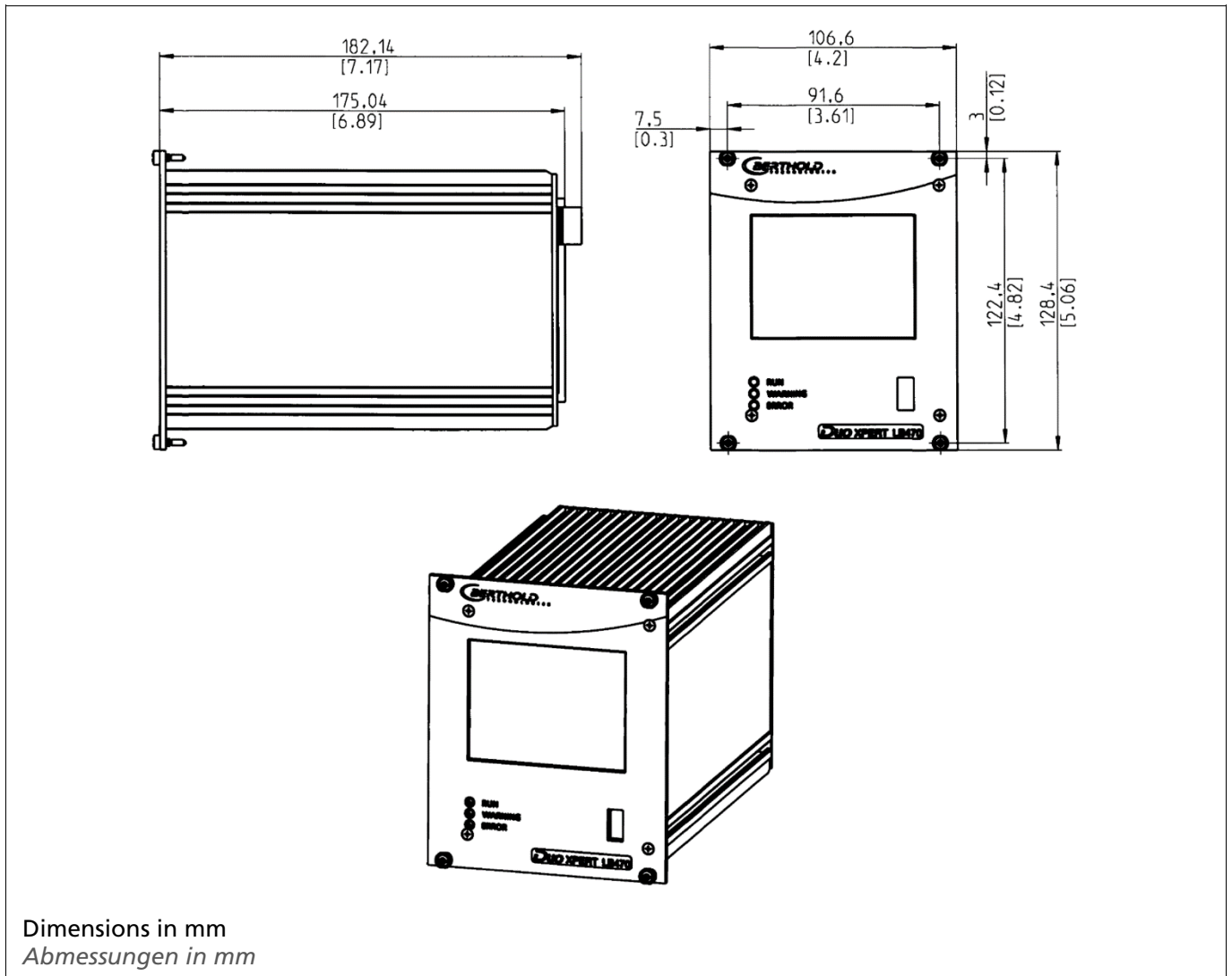
² Kein Zertifikat
 No certification

19" subrack 19" Baugruppenträger



Technical Data Technische Daten	
Dimensions Abmessungen	3HE/84TE/5T, 482x132x172mm (WxHxD)
Max. Assembly Max. Bestückung	- 3 Master, 3 Slave - 2 Master, 6 Slave - 4 Master - 1 Master, 9 Slave - 12 Slave
Weight (with circuit board, without modules) Gewicht (mit Anschlussplatine, ohne Module)	1.4 kg
Weight terminal block Gewicht Klemmenblock	220 g
Operational temperature Betriebstemperatur	-20°C ... +50°C, not condensing nicht kondensierend
Storage temperature Lagerungstemperatur	-30°C ... +60°C
Degree of protection Schutzklasse	IP20

Master EVU Master AWE



Technical Data Technische Daten

Dimensions Abmessungen	117/128/172mm (WxHxD)
Weight Gewicht	1200 g
Operational temperature Betriebstemperatur	-20°C ... +50°C, not condensing. Avoid direct sunlight. Unobstructed air circulation must be provided to the subrack. -20°C ... +50°C nicht kondensierend. Direkte Sonneneinstrahlung ist zu vermeiden. Für eine ungehinderte Luftzirkulation um den Baugruppenträger ist zu sorgen.
Storage temperature Lagerungstemperatur	-20°C ... +85°C
Degree of protection Schutzgrad	IP20

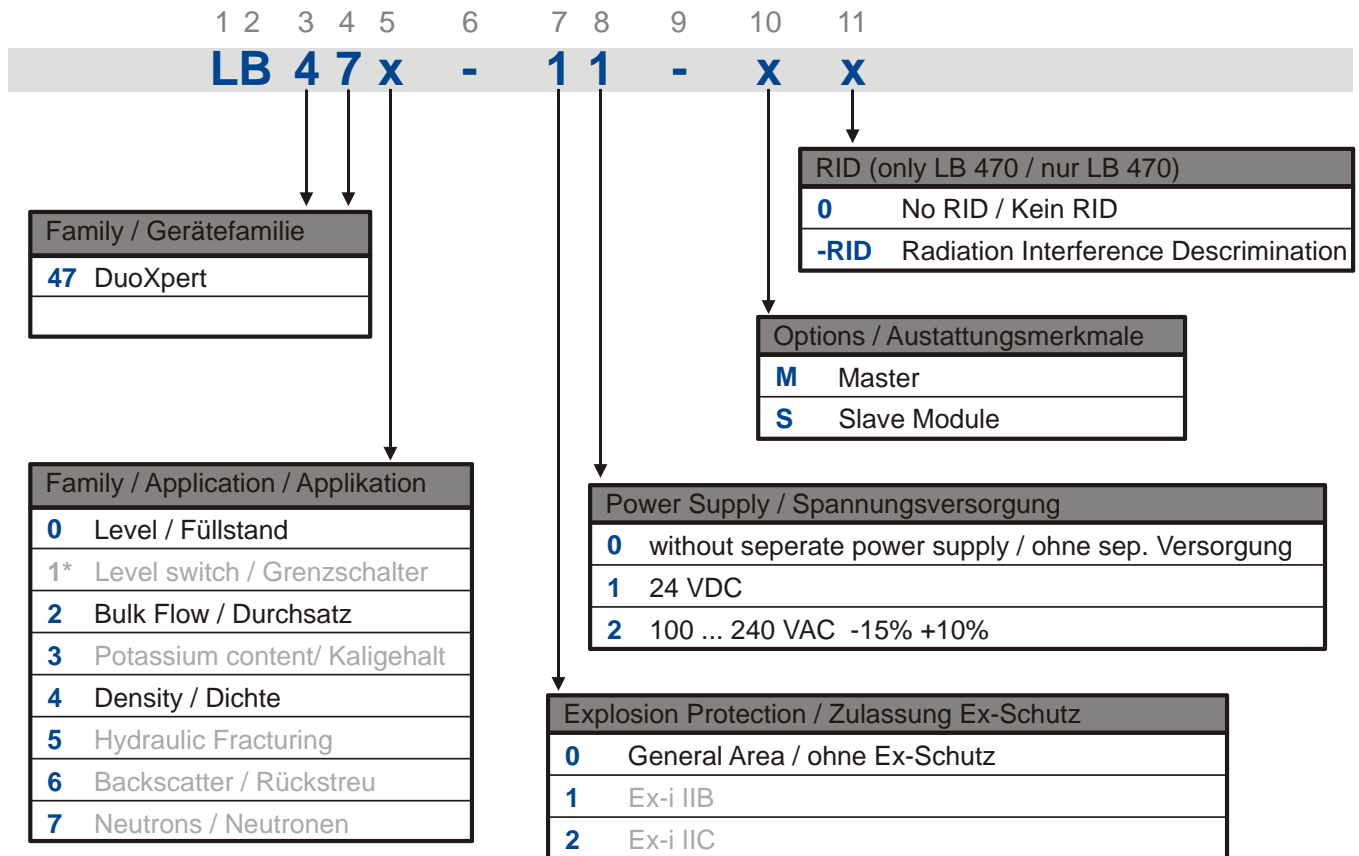
<p>Connections</p> <p><i>Anschlüsse</i></p>	<ul style="list-style-type: none"> - USB port for the connection to the USB storage medium - Master/slave connection (4-pin) and plug - RJ45 connection for Ethernet (on back wall) - 32-pin plug connector according to DIN 19465 Series C <ul style="list-style-type: none"> - <i>USB-Port zum Anschluss von USB-Speichermedium</i> - <i>Master/Slave Buchse (4-polig) und Stecker</i> - <i>RJ45-Buchse für Ethernet (an Rückwand)</i> - <i>32 polige Stiftleiste nach DIN 19465 Baureihe C</i>
<p>Display</p>	<ul style="list-style-type: none"> - graphical LCD display - 320 x 240 points, 262,000 colours - Dimmable LED background lighting - Touch screen <ul style="list-style-type: none"> - <i>graphisches LCD-Display</i> - <i>320 x 240 Punkte, 262.000 Farben</i> - <i>Dimmbare LED Hintergrundbeleuchtung</i> - <i>Touchscreen</i>
<p>Computer core</p> <p><i>Rechnerkern</i></p>	<ul style="list-style-type: none"> - Processor: Dual Core DSP/ARM Controller - clock frequency: 300 MHz internal (20 MHz external quartz) - ROM: 512 KByte - RAM: 64 MByte ext. SDRAM, 128 KByte int. shared RAM - FLASH: 8 MByte external serial <ul style="list-style-type: none"> - <i>Prozessor: Dual Core DSP/ARM Controller</i> - <i>Taktfrequenz: 300 MHz intern (20MHz externer Quarz)</i> - <i>ROM: 512 KByte</i> - <i>RAM: 64 MByte ext. SDRAM, 128 KByte int. shared RAM</i> - <i>FLASH: 8 MByte extern seriell</i>

Power Supply Stromversorgung	
<p>Voltage</p> <p><i>Spannung</i></p>	100-240 V AC 50/60 Hz (wide range input) +/- 10% 21-32 V DC (24V DC power input)
<p>Power consumption</p> <p><i>Leistungsaufnahme</i></p>	22 VA, 15 W
<p>Fuses</p> <p><i>Sicherungen</i></p>	Internal, 2 x 250 V, 1A delayed, 5x20 mm, 1500 A breaking capacity IEC 60127-2, 1x 250 V TR5 T80mA (Ø 8,5 mm)

Interfaces Schnittstellen	
Current output <i>Stromausgang</i>	<p>4-20mA internally switched from power source to sink current (according to NAMUR recommendation NE 006 and NE 043). Continuous short circuit proof and isolated (500 V). Internal resistance about 105 ohms max. Burden when operating as a power source: 850 ohm. Internal monitoring of the loop current and additional error signalling by hardware on detection of a fault condition.</p> <p><i>4-20mA (nach Namur-Empfehlung NE 006 und NE 043) intern von Stromquelle auf Stromsenke umschaltbar. Dauerhaft kurzschlussfest und potentialgetrennt (500 V). Innenwiderstand ca. 105 Ohm max. Bürde bei Betrieb als Stromquelle: 850 Ohm. Interne Überwachung des Schleifenstroms und zusätzliche Fehlersignalisierung durch Hardware bei Erkennung eines Fehlerzustands.</i></p>
Current input <i>Stromeingang</i>	<p>4-20mA (according to NAMUR recommendation NE 006 and NE 043) switchable via software on frequency input, electrically isolated (500 V). Internal resistance approx. 300 ohm max. input voltage: 24V DC</p> <p><i>4-20mA (nach Namur-Empfehlung NE 006 und NE 043) per Software umschaltbar auf Frequenzeingang, potentialgetrennt (500 V). Innenwiderstand ca. 300 Ohm max. Eingangsspannung: 24V DC</i></p>
Impulse input <i>Impuls-eingang</i>	<p>Frequency 0-100kHz, $U_{max} = 28 V$, right angle signal form, low <1,5 V; high 4 – 28 V. Switchable to current input</p> <p><i>Frequenz 0-100kHz, $U_{max} = 28 V$, Rechteck-Signalform, Low <1,5 V; High 4 – 28 V. Umschaltbar auf Stromeingang</i></p>
Digital outputs <i>Digitale Ausgänge</i>	<p>3 relays, $U_{max} = 33V AC_{eff}, 46 V DC$; $I_{max} = 1 A$ functions: Relay 1: SPDT for error signalling Relay 2: SPDT assignable by software Relay 3: SPST assignable by software</p> <p><i>3 Relais, $U_{max} = 33 V AC_{eff}, 46V DC$; $I_{max} = 1 A$ Funktionen: Relais 1: SPDT zur Fehlersignalisierung Relais 2: SPDT über Software zuweisbar Relais 3: SPST über Software zuweisbar</i></p>
Digital inputs <i>Digitale Eingänge</i>	<p>2 x together electrically isolated (500 V) Switch between DigIn and GND, U_{outmax} approx. 24 V Function configurable via software</p> <p><i>2 x gemeinsam potentialgetrennt (500 V), Schalter zwischen DigIn und GND, U_{outmax} ca. 24 V Funktion über Software konfigurierbar</i></p>
External supply <i>Externe ersorgung</i>	<p>Output voltage: 24 V DC Output current: max. 150 mA</p> <p><i>Ausgangsspannung: 24 V DC Ausgangsstrom: max. 150 mA</i></p>
RS485	<p>for master/master communication, and testing and evaluation purposes. not isolated from main electronics and USB port electrically isolated from remaining I/Os (500 V)</p> <p><i>für Master/Master Kommunikation und Prüf- und Testzwecke. Nicht potentialgetrennt von Hauptelektronik und USB-Anschluss potentialgetrennt von restlichen I/Os (500 V)</i></p>

USB port	<p>1 x USB 2.0 Type A (Host) via front plate to the connection of an ext. mouse, keyboard or storage medium Uout = 5V, Ioutmax = 0.5 A</p> <p><i>1 x USB 2.0 Typ A (Host) über Frontplatte zum Anschluss einer ext. Maus, Tastatur oder Speichermedium Uout = 5V, Ioutmax = 0,5 A</i></p>
Ethernet	<p>RJ45 connection via back wall, 10Mbit, DHCP supported, max. 3 m</p> <p><i>RJ45-Buchse über Rückwand, 10Mbit, DHCP unterstützt, max. 3 m</i></p>

Number Key LB 47x Nummernschlüssel LB 47x



* used by othe hardware / belegt durch andere Hardware

Declaration of Conformity Konformitätserklärung



BERTHOLD TECHNOLOGIES GmbH & Co. KG
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75323 Bad Wildbad, Germany
Phone +49 7081 177-0
Fax +49 7081 177-100
info@Berthold.com
www.Berthold.com

EG-Declaration of Conformity (ORIGINAL)

File.No.: CE20028-2

We, hereby declare under our sole responsibility that the design of the following products / systems / units / machines brought into circulation by us comply with the relevant harmonized rules of the EU.

This declaration loses its validity should modifications or unsuitable and improper use take place without our authorisation.

Product name: **radiometric evaluation system
DuoXpert**

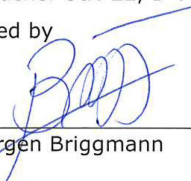
Type / model: **LB 47x**

	directive	applied standards
LVD	2014/35/EU	EN 61010-1 2010
RoHS	2011/65/EG	
EMC	2014/30/EU	EN 61326-1 2013 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-11 EN 61000-3-2 Namur NE21 2012

This declaration is issued by the manufacturer

BERTHOLD TECHNOLOGIES GmbH & Co. KG
Calmbacher Str. 22, D-75323 Bad Wildbad, Germany

released by


Dr. Jürgen Briggmann

Head of R&D
Bad Wildbad, 1st of September, 2015

Registergericht / Court of Registration
Persönlich haftende Gesellschafterin / Fully liable Associates
Registergericht / Court of Registration
Geschäftsführung / Management
USt.-Id-Nr. / VAT Reg. No.
Deutsche Steuernummer / German Tax No.
WEEE-Reg. No.

Stuttgart HRA 330991
BERTHOLD TECHNOLOGIES Verwaltungs-GmbH
Stuttgart HRB 331520
Horst Knauff, Dr. Dirk Mörmann
DE813050511
49038/08038
DE99468690

Sparkasse PF-CW 75323 Bad Wildbad
Volksbank 75119 Pforzheim
Commerzbank 75105 Pforzheim

Konto/Account No. 8 045 003 (BLZ 666 500 85)
Konto/Account No. 957 004 (BLZ 666 900 00)
Konto/Account No. 6 511 120 (BLZ 666 800 13)

SWIFT-BIC PZHSDE66
SWIFT-BIC VBPFDE66
SWIFT-BIC DRES DEFF 666

IBAN: DE37 6665 0085 0008 0450 03
IBAN: DE85 6669 0000 0000 9570 04
IBAN: DE05 6668 0013 0651 1120 00



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EG-Konformitätserklärung (ORIGINAL)

Dok.Nr.: CE20028-1

Hiermit erklären wir in alleiniger Verantwortung, dass die Bauart des(r) nachfolgend bezeichneten Geräte / Systems / Anlage / Maschine in der von uns in den Verkehr gebrachten Ausführung den unten genannten einschlägigen Harmonisierungsvorschriften der EU entsprechen.

Durch nicht mit uns abgestimmte Änderungen oder nicht bestimmungsgemäßen Gebrauch verliert diese Erklärung ihre Gültigkeit.

Produktbezeichnung: **radiometrisches Auswertesystem DuoXpert**

Typenbezeichnung / Modell: **LB 47x**

	Richtlinie (Fundstelle)	angewendete Normen und weitere Spezifikationen	
NSR	2014/35/EU	EN 61010-1	2010
RoHS	2011/65/EG		
EMV	2014/30/EU	EN 61326-1 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-11 EN 61000-3-2 Namur NE21	2013 2012

Diese Erklärung wird verantwortlich für den Hersteller

BERTHOLD TECHNOLOGIES GmbH & Co. KG
Calmbacher Str. 22, D-75323 Bad Wildbad

abgegeben durch


Dr. Jürgen Briggmann

Leiter Entwicklung

Bad Wildbad, den 1. September 2015

Registergericht / Court of Registration
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DE99468690

Sparkasse PF-CW	75323 Bad Wildbad	Konto/Account No. 8 045 003 (BLZ 666 500 85)	SWIFT-BIC PZHSDE66	IBAN: DE37 6665 0085 0008 0450 03
Volksbank	75119 Pforzheim	Konto/Account No. 957 004 (BLZ 666 900 00)	SWIFT-BIC VBPFDE66	IBAN: DE85 6669 0000 0000 9570 04
Commerzbank	75105 Pforzheim	Konto/Account No. 6 511 120 (BLZ 666 800 13)	SWIFT-BIC DRES DEFF 666	IBAN: DE05 6668 0013 0651 1120 00

Certificates

Zertifikate

NRTL certification US/CAN wall-mounted housing NTRL Zertifikat US/CAN Wandgehäuse



Certificate of Compliance

Nemko-CCL, Inc.

Certificate: NA201610530

Date Issued: January 20, 2016

Project: 257087-7.1

Issued to: Berthold Technologies GmbH & Co. KG
Calmbacher Straße 22
75323 Bad Wildbad
Germany

The products listed below have been certified as being compliant with all applicable requirements of the specifications listed and are eligible to bear the following certification mark



Issued by:

Robert Keller, Senior Engineer/Safety Supervisor

Authorized by:

Thomas Jackson, Certification Manager

PRODUCTS

MEASUREMENT, CONTROL, OR LABORATORY EQUIPMENT – Certified to US and Canada Standards

Product: Process measurement unit

Model: Wall-mounted LB 47x, 1M/3S; Wall-mounted LB 47x, 2M (x can be 0 to 8 and describes different software versions for the master and slave modules not affecting safety).

Ratings: Wall-mounted LB 47x, 1M/3S: 40VA 100-240V, 50/60Hz, Class I; Wall-mounted LB 47x, 2M: 44VA 100-240V, 50/60Hz, Class I

The certification system, as described in ISO/IEC Guide 67 (Conformity Assessment – Fundamentals of Product Certification), most closely resembles System 3

Nemko-CCL, Inc. 1940 West Alexander Street Salt Lake City, Utah 84119-2039 Tel (801) 972-6146 Fax (801) 972-8432



NFCC-002 Issue 2 May 2014

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NRTL certification US/CAN wall-mounted housing (continued) *NTRL Zertifikat US/CAN Wandgehäuse (Fortsetzung)*

APPLICABLE REQUIREMENTS

UL Std. No. 61010-1 2nd Edition - Safety Requirements for Electrical Equipment for
Measurement, Control, and Laboratory Use – Part 1: General
Requirements

CAN/CSA-C22.2 No. 61010-1-04 Second Edition - Safety Requirements for Electrical Equipment for
Measurement, Control, and Laboratory Use – Part 1: General
Requirements

This certificate is issued on condition that the holder complies and will continue to comply with the requirements of the above mentioned specifications and
pursuant to the terms and conditions specified in the Certification Agreement.

The certification system, as described in ISO/IEC Guide 67 (Conformity Assessment – Fundamentals of Product Certification), most closely resembles System 3

Nemko-CCL, Inc. 1940 West Alexander Street Salt Lake City, Utah 84119-2039 Tel (801) 972-6146 Fax (801) 972-8432



NFCC-002 Issue 2 May 2014

Page 2 of 3

NRTL certification US/CAN wall-mounted housing (continued) NTRL Zertifikat US/CAN Wandgehäuse (Fortsetzung)

Supplement to Certificate of Compliance

Certificate: NA201610530

Project: 257087-7.1

Nemko-CCL grants a license to the applicant to apply the Certification Mark to the certified products and that the mark shall only be affixed at the following factory locations

Factory Information

Factory Name	Location
Berthold Technologies GmbH & Co. KG	Calmbacher Straße 22 75323 Bad Wildbad Germany

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
257087-7.1	January 20, 2016	Original Certification: Model: Wall-mounted LB 47x, 1M/3S; Wall-mounted LB 47x, 2M (x can be 0 to 8 and describes different software versions for the master and slave modules not affecting safety). Ratings: Wall-mounted LB 47x, 1M/3S: 40VA 100-240V, 50/60Hz, Class I; Wall-mounted LB 47x, 2M: 44VA 100-240V, 50/60Hz, Class I

This Supplement forms an integral part of the Certificate of Compliance

The certification system, as described in ISO/IEC Guide 67 (Conformity Assessment - Fundamentals of Product Certification), most closely resembles System 3

Nemko-CCL, Inc. 1940 West Alexander Street Salt Lake City, Utah 84119-2039 Tel (801) 972-6146 Fax (801) 972-9432



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Page 3 of 3

NRTL certification US/CAN DuoXpert LB 47x
NTRL Zertifikat US/CAN DuoXpert LB 47x



Certificate of Compliance

Nemko-CCL, Inc.

Certificate: NA201510498

Date Issued: September 17, 2015

Project: 235982-14.1

Issued to: Berthold Technologies GmbH & Co. KG
Calmbacher Straße 22
75323 Bad Wildbad
Germany

The products listed below have been certified as being compliant with all applicable requirements of the specifications listed and are eligible to bear the following certification mark



Issued by:

Robert Keller, Senior Engineer/Safety Supervisor

Authorized by:

Thomas Jackson, Certification Manager

PRODUCTS

MEASUREMENT, CONTROL, OR LABORATORY EQUIPMENT – Certified to US and Canada Standards

Product: Process measurement unit for building-in

Model: DuoXpert LB47x-02-M; DuoXpert LB47x-02-S (x can be 0 to 8 and describes different software versions for the master and slave modules not affecting safety)

Ratings: LB47x-02-M: 100-240V AC 22VA 50/60Hz; LB47x-02-S: 100-240V AC 6VA 50/60Hz

APPLICABLE REQUIREMENTS

UL Std. No. 61010-1 3rd Edition - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements

CAN/CSA-C22.2 No. 61010-1-12 Third Edition – Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements

This certificate is issued on condition that the holder complies and will continue to comply with the requirements of the above mentioned specifications and pursuant to the terms and conditions specified in the Certification Agreement.

The certification system, as described in ISO/IEC Guide 67 (Conformity Assessment – Fundamentals of Product Certification), most closely resembles System 3

Nemko-CCL, Inc. 1940 West Alexander Street Salt Lake City, Utah 84119-2039 Tel (801) 972-6146 Fax (801) 972-8432



NRTL certification US/CAN DuoXpert LB 47x (continued) NTRL Zertifikat US/CAN DuoXpert LB 47x (Fortsetzung)

Supplement to Certificate of Compliance

Certificate: NA201510498

Project: 235982-14.1

Nemko-CCL grants a license to the applicant to apply the Certification Mark to the certified products and that the mark shall only be affixed at the following factory locations

Factory Information

Factory Name	Location
Berthold Technologies GmbH & Co. KG	Calmbacher Straße 22 75323 Bad Wildbad Germany

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
235982-14.1	September 17, 2015	Original Certification: Model: DuoXpert LB47x-02-M; DuoXpert LB47x-02-S (x can be 0 to 8 and describes different software versions for the master and slave modules not affecting safety) Ratings: LB47x-02-M: 100-240V AC 22VA 50/60Hz; LB47x-02-S: 100-240V AC 6VA 50/60Hz

This Supplement forms an integral part of the Certificate of Compliance

The certification system, as described in ISO/IEC Guide 67 (Conformity Assessment - Fundamentals of Product Certification), most closely resembles System 3

Nemko-CCL, Inc. 1940 West Alexander Street Salt Lake City, Utah 84119-2039 Tel (801) 972-6146 Fax (801) 972-8432



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Parts overview Übersicht Zubehör

ID. No. <i>Id. Nr.</i>	Description <i>Beschreibung</i>
64576	LB 474-01-M Density Transmitter (24 VDC) <i>LB 474-01-M Dichtemessgerät (24 VDC)</i>
64575	LB 474-02-M Density Transmitter (100...240 VAC) <i>LB 474-02-M Dichtemessgerät (100...240 VAC)</i>
63286	LB 470 Slave (24 VDC) <i>LB 470 Slave (24 VDC)</i>
63285	LB 470 Slave (100...240 VAC) <i>LB 470 Slave (100...240 VAC)</i>
56925-4BA1	Operating manual DuoSeries LB 474 Density, German <i>Betriebsanleitung Dichte (deutsch)</i>
56925-4BA2	Operating manual DuoSeries LB 474 Density, English <i>Betriebsanleitung Dichte (englisch)</i>
63781	Wall-mounted Housing for LB 47x 1x Master / 3x Slave (24 VDC) <i>Wandgehäuse für LB 47x, 1x Master / 3x Slave (24 VDC)</i>
63782	Wall-mounted Housing for LB 47x 1x Master / 3x Slave (110...240 VAC) <i>Wandgehäuse für LB 47x, 1x Master / 3x Slave (110...240 VAC)</i>
63783	Wall-mounted Housing for 2x LB 47x Master (24 VDC) <i>Wandgehäuse für LB 47x, 2x Master (24 VDC)</i>
63784	Wall-mounted Housing for 2x LB 47x Master (110...240 VAC) <i>Wandgehäuse für LB 47x, 2x Master (110...240 VAC)</i>
64402	Wall-mounted Housing for 2x LB 47x Master (terminal blocks) <i>Wandgehäuse für LB 47x, 2x Master (Klemmblöcke)</i>
59484	19" rack for LB 47x, 4 x Master <i>19"-Baugruppenträger für LB 47x, 4 x Master</i>
59481	19" rack for LB 47x, 3x (1x Master & 1x Slave) <i>19"-Baugruppenträger für LB 47x, 3x (je 1x Master & 1x Slave)</i>
64607	19" rack, 84 HP / 3 RU for use with terminal blocks <i>19"-Baugruppenträger für den Einsatz mit Klemmblöcken</i>
59477	Terminal block for LB 47x, Master <i>Klemmenblock für LB 47x, Master</i>
59478	Terminal block for LB 47x, Slave <i>Klemmenblock für LB 47x, Slave (mit Führungsschienen)</i>
37526	Front Cover Plate 21 HP / 3 RU (Master) <i>Blindplatte 21TE / 3 HE (Master)</i>
59501	Front Cover Plate 7 HP / 3 RU (Slave) <i>Blindplatte 7TE / 3 HE (Slave)</i>
64608	Connector for LB 47x slaves when changing from LB 44x to LB 47x slaves <i>Stecker für LB 47x Slaves bei Umrüstung von LB44x auf LB47x Slaves</i>

Modifications due to technical advancement reserved.

Änderungen im Zuge technischer Weiterentwicklung vorbehalten.